# Team develops tools for assessing vulnerability of buildings to chemical and biological attacks

Models show how agents move through buildings

By Chris Burroughs

With anthrax making its deadly appearance on the East Coast, one question keeps emerging in the minds of many Americans. How can we protect our buildings from chemical and biological attacks?

A Sandia team led by Richard Griffith (9117) has developed modeling and simulation tools for assessing the threat and vulnerability of buildings to such assaults. This includes looking at how chemical and biological agents move and deposit inside a building, developing and assessing mitigation strategies, guiding the use of detection methods, and examining the effectiveness of cleanup and decontamination efforts.

Richard began working on the project following the 1995 sarin gas release in Tokyo's subway system, where it became apparent that chemical and biological attacks by terrorists could be a trend of the future. Over the last few years a large team of Sandians, scattered across several divisions and both sites, has worked to develop and apply these modeling and analysis capabilities. Interest from government agencies and others in the work has skyrocketed since Sept. 11.

Using sophisticated Sandia-developed computer modeling and visualization capabilities, the team can simulate how various chemical and biological agents — such as anthrax, smallpox, sarin, and mustard gas — flow through a building and deposit on various surfaces.

"We start by mapping out the building and creating a computational model from the electronic AUTOCAD blueprints, including all the rooms and areas served by each air handler and all the air ducts," Richard says. "Then we simulate the release of a chemical or biological agent directly into different parts of the building, or from the outside for exterior releases."

The computer model, known as KCNBC, predicts where the agent will move (Continued on page 5)

### Flag run across the nation



HIS TRUE COLORS — John Yip (3132) trains for the Flag Across America run sponsored by American Airlines and United Airlines. The run began in Boston on Oct. 11 and ended in Los Angeles on Nov. 11, retracing the scheduled route of two aircraft hijacked on Sept. 11. John, one of several Sandians to run legs of the route through New Mexico, carried the US flag on a stretch between Moriarty and Tijeras Canyon. See the story on page 11. (Photo by Randy Montoya)

# SandiaLabNews

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# Sandia/Los Alamos Center for Integrated Nanotechnologies moves forward

'Our challenge is to get nanoscience out of the beaker'

— Terry Michalske

By Neal Singer

With an urgency not often seen from Washington, the expected date for the conceptual design report for the Sandia/Los Alamos Center for Integrated Nanotechnologies (CINT) has been moved up from January 2002 to this month.

DOE review of the fledgling program is now expected to take place Dec. 10-11, rather than in February, says Terry Michalske (1040), interim CINT director. The speed-up involves "the need to be prepared to accept FY02 capital funds," he says.

Nanotechnologies operate at sizes approximately a thousand times smaller than microtechnologies. (Nano refers to a nanometer, a billionth of a meter.)

Nanotechnologies are of interest not because they can be used to make very small structures, says Terry, but because the commonly understood properties of ordinary materials change dramatically and, it is hoped, usefully for those who can integrate these new capabilities into the micro or even macroworld.

Silicon, for example, in nanosized clumps emits light, offering a new realm of operation for a mainstay semiconductor material widely known for controlling electrons but not photons. The fluidity and friction of apparently well-characterized materials change unpredictably. Gold and copper become as hard as ceramics.

#### It's like alchemy

"It's like alchemy," says Terry. "You start with the same material and make it do something completely new. We know a lot, yet much of the nanoworld remains a mystery. This is why nanoscience has captured the interest of the scientific community."

Proof of wide interest in the science and the proposed Center came when a CINT planning workshop, held in Albuquerque Sept. 28-29 and expected to attract perhaps 60 participants, attracted applications from more than 200 scientists from 24 states (48 universities, 14 companies, 12 laboratories) as well as a smattering of

(Continued on page 4)

# DAKOTA software soon to be available free on web

By Chris Burroughs

Weapons designers and analysts often ask themselves questions such as: "What is the best design?" "How safe is my design?" "How much confidence do I have in my answer?" A Sandiadeveloped software toolkit can help answer these questions and assist engineers in designing anything from components to sophisticated systems.

The toolkit, DAKOTA version 3.0, will soon be on the Web and available for free.

DOE recently granted DAKOTA 3.0 (Design Analysis Kit for Optimization and Terascale Applications) an open-source release under a GNU General Public License. This means any company engineer or university researcher will be able to download DAKOTA and use it to improve

(Continued on page 10)

#### **Ground Zero NYC**



Sandian Richard Sparks spent 22 days at Ground Zero in New York helping with the recovery effort. While there, he was confronted by scenes of devastation — and heroism — unlike any ever seen on American soil. A two-page photo spread begins on page 8.

Sensor invention designed to enhance irrigation efficiency

3

7 K-9 camera project gives Sandian closeup view of Ground Zero at WTC

Sandia retirees' life expectancies differ from 'Boeing' urban legend

Pentagon cleanup difficult in every way, says Sandia team leader

6

# This & That

<u>Larry's back, but "wobbly"</u> — They say once you ride a bike, you never forget how. The same may be said about writing a column, but I'm feeling a little wobbly as I resume it after missing four straight columns. Thanks to Editor Ken Frazier for writing it while I couldn't.

So what was I doing during this time, you may be asking. While I trust many of you, I can't divulge exactly what I was doing or where I was, because I don't want to jeopardize national security or compromise my contacts at the CIA, NSA, FBI, NRO, UN, OAS, and EIEIO. But I think I finally have them pointed in the right direction, at least to the point where I felt I could return to my vital column-writing duties.

(I hope this new anti-delusional medication works better than what I was using previously. Maybe I'll take two at a time and see if that works!)

Morning smiles appreciated — Others have already said it, but I want to express my personal appreciation to the Sandia and Kirtland police officers guarding our gates and checking IDs. They have a big responsibility under difficult circumstances, and I think they are doing a great job. Not only are they doing it well, the officers I see most often (Eubank gate) are doing it with a smile and friendly greeting. Keeping smiles on their faces will become increasingly difficult as winter comes on and the fierce east winds come howling down the canyon. We can help them by giving them a smile of our own and a hearty "Thank you, and have a nice day" as we arrive.

Fewest managers? — This summer we explored which Sandians have had the most managers during their careers. One had 16 or 21 managers (depending on definitions) in 23 years. Another had 26 in 34 years. Now Don Jelinek (2344) would like to know who has had the fewest managers. Incredibly, Don had only two managers in his first 34 years at the Labs, and just got his third. "I had C.S. Williams from November 1967 through December 1989 (when he retired), and R. M. Axline from January 1990 through October 2001," Don says. Any challengers?

Performance review profundities — Old buddy Barry Swartz (3130) urged me to invite readers to submit "profound" remarks they have heard from managers during performance reviews. So, you're invited. Barry's favorite, from a year long ago when there was little money for raises, is, "You picked a bad year to have a good year." Realizing that managers also hear some "zingers" from employees during performance review, I invite managers to submit particularly interesting comments they've heard during performance reviews. I'll print names only with your permission.

"Investing" at the casinos — I've never been much of a gambler, or financial wizard either for that matter, but I'm thinking hard about adopting a new financial strategy next year. I may take my money out of the stock market and instead run it through some local casino slot machines. Some casinos advertise a 97 percent or so return, which beats heck out what I've gotten in the market the past few years.

- Larry Perrine (845-8511, MS 0165, lgperri@sandia.gov)

# Sandia LabNews

#### Sandia National Laboratories

http://www.sandia.gov/LabNews

Albuquerque, New Mexico 87185-0165 Livermore, California 94550-0969 Tonopah, Nevada • Nevada Test Site • Amarillo, Texas • Carlsbad, New Mexico • Washington, D.C.

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Ken Frazier, Editor	505/844-6210
Bill Murphy, Writer	505/845-0845
Chris Burroughs, Writer	505/844-0948
Randy Montoya, Photographer	505/844-5605
Nancy Garcia, California site contact	925/294-2932

Contributors: Janet Carpenter (844-7841), John German (844-5199), Neal Singer (845-7078), Larry Perrine (columnist, 845-8511), Howard Kercheval (844-7842), Iris Aboytes (Milepost photos, 844-2282), Rod Geer (844-6601), Pam Welch (Ads, 844-4902).

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# Jay Vinson honored with medal from DoD

Jay Vinson, Manager of RV Target Instrumentation Dept. 2666, was awarded a medal last week for his work in the Office of the Assistant to the Secretary of Defense for Nuclear, Chemical, and Biological Defense Programs.

Presenting the medal was Fred Celec, Deputy Assistant to the Secretary of Defense for Nuclear

Jay was on a special assignment to the Office of the Assistant to the Secretary of Defense from Jan. 3, 2000, to April 1, 2001. As part of his responsibilities he coordinated the development and approval of the "Phase 6.X" Refurbishment Process. This process now governs all alterations, modifications, and refurbishments to the nuclear weapons stockpile.

"This is the first time since 1953 that DOE and the Department of Defense agreed to a new process," Jay says. "From the beginning to approval took approximately two months — a sort of record for Washington!"

The process was approved in April 2000 by the Nuclear Weapons Council and signed by Ernesto Moniz, then Undersecretary of Energy; Gen. Richard Meyers, then Vice Chairman of the Joint Chiefs of Staff and now Chairman; and Jacque Gansler, then Under Secretary of Defense for Acquisition, Technology, and Logistics.

Also as part of the special assignment Jay led the Office of Secretary of Defense coordination of the Hard and Deeply Buried Pre-Phase 6.2/6.2A approvals. The Phase 6.2/6.2A is expected to be approved by the Nuclear Weapons Council soon.

# President signs bill bringing increased funding to DOE, NNSA, national labs

President Bush Monday signed into law the FY 2002 Energy and Water Development Appropriations Bill (HR 2311), providing increased funding for DOE and the national labs.

The bill provides \$19.5 billion for DOE in FY2002, which is \$878 million over FY2001 funding and \$1.4 billion over the president's budget request. The bill funds National Nuclear Security Administration (NNSA) nuclear weapons stockpile stewardship at \$5.7 billion, which is \$700 million or a 14 percent increase over last year's funding level and \$400 million over the budget request.

The bill also provides \$200 million for a major infrastructure rebuilding program within the DOE nuclear weapons complex, which includes Sandia and Los Alamos national labs.

"This has been a tough process, but I believe we've now enacted a fair bill that accommodates, to the best extent possible, a lot of competing desires," said Sen. Pete Domenici, R-N.M., ranking Republican on the Senate Energy and Water Development Appropriations Subcommittee. "We've done our best to provide the funding that will be needed for the labs to do all we demand of them in this increasingly dangerous world," Domenici said Tuesday.

"We've significantly increased funding because it is very important that we get so many lab missions back on track. . . . We've provided infrastructure improvement funds because it would be grossly negligent to continue to ignore the great need to upgrade decades-old facilities at the labs."

The bill includes provisions added last year allowing a 6 percent set-aside for the Laboratory Directed Research and Development (LDRD) program, which sets aside a percentage of each laboratory's budget for innovative research.

DOE Basic Science research activities are funded at \$3.23 billion, \$53 million over FY2001 and \$74 million over the budget request.

The bill also provides \$854 million to nuclear nonproliferation, \$80 million over the administrations's budget request.

"Before Sept. 11, I was a strong believer in the work our laboratories do in research, development, and deployment of technologies we need to detect and respond to the growing threat of chemical, biological, and nuclear terrorism," said Domenici. "After the horrific tragedies inflicted on us that day, I am even more convinced that this is a wise investment in our safety."

Here are some specific Sandia-related items in the bill, as reported by Domenici:

- Operation of pulsed power facilities, add \$10 million.
  - Z machine upgrade, \$10 million.
  - MESA construction line, \$67 million.
- Joint Computational Engineering Lab, \$13.4 million.
- Center for Integrated Nanotechnology (Sandia and LANL), \$1 million [see page one article in this issue].
  - Petawatt laser design, \$3 million.
  - Sandia environmental remediation, \$5 million.



FRED CELEC, Deputy Assistant to the Secretary of Defense for Nuclear Matters, right, presents a medal to Jay Vinson, Manager of RV Target Instrumentation Dept. 2666. (Photo by Walt Dickenman)

## Soil moisture sensor could enhance irrigation efficiency

By Nancy Garcia

Two big-ticket items in California, agriculture and water, could both benefit from a soil moisture sensor invented by Ken Condreva of Telemetry Systems Engineering Dept. 8416.

Rainless for months at a stretch, the state carefully monitors and marshals out its water supply — partially provided by runoff from snow melt.

Ken spent about a month this summer testing his new invention, which he hopes will help growers optimize irrigation efficiency. Ralph Boehmer and Danny Dominguez (both 8512) drilled a five-foot-deep hole to bury the



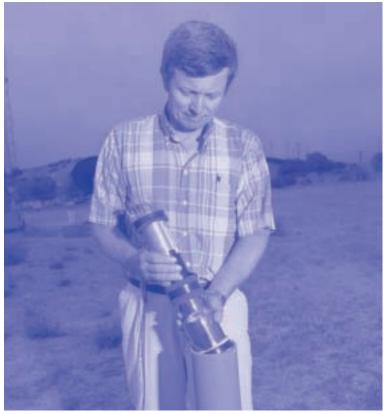
JUST ADD WATER – Sealed with red plastic, the installation is ready to detect, from as deep as five feet below ground, water added with a garden sprinkler.

sensor, which is about the size of two coffee cans placed end-to-end. Like an earlier sensor Ken created to measure water in the snowpack (now being commercialized by Canberra Industries), the device detects how water attenuates incoming cosmic radiation. A reference sensor mounted above ground measures the total incoming cosmic radiation (which fluctuates over time).

Ken says he'd thought about applying this approach to soil moisture and wondered if the attenuation of cosmic rays by the soil itself might decrease the sensitivity. In a couple of 10-day-long tests, he found that by averaging the signal over time, he could see differences in moisture amounting to as little as an inch or less of water, applied at the surface with a sprinkler.

He gathered his data on a computer in a small outbuilding provided by Herb Woelffer and Ed Diemer (both of 8511). He envisions the agricultural version will have a battery and transmit data to a collection point, possibly even controlling irrigation automatically.

Several systems exist that detect moisture at, or near, the surface of the soil. However, none have been developed to detect moisture this far down, which Ken hopes will be espe-



FIELD TEST — Ken Condreva installs his soil-moisture sensor, based on water's attenuation of cosmic rays, at the arid test site this summer.

# Sandia California News

cially useful for crops with deep root systems in vineyards or orchards.

His summer research project was paid for with \$2,500 from a royalty fund that Sandia collects and re-invests in R&D and related activities, such as promotion, training, and cost-sharing. The project has led to a recently filed patent application.

"There has been a long-felt need for a simple, inexpensive, reliable, and practical

"There has been a long-felt need for a simple, inexpensive, reliable, and practical method for determining water content."

method for determining water content," says Sandia patent agent Tim Evans (11600). Ken says another advantage of the sensor is that it measures moisture over a relatively wide area, which is proportional to the depth of the buried sensor. At five feet deep, the sensor measures moisture from about a 10-foot-wide circle at the surface.

To study the feasibility of the device, Ken watered the surface with about six inches of water, applied with a garden sprinkler. Over the next few days, he observed as the water shielded incoming cosmic radiation, then slowly dried or percolated away, returning to the baseline reading.

Like the automated snowpack water sensor, he says, the new soil moisture device "can contribute to better water management."

This matters in relatively arid areas like parts of California that only receive 15 inches of rain a year (all between November and March). The state Department of Water Resources has a division devoted exclusively to water efficiency, and water-use planning is a high priority in the state's \$25 billion annual agricultural industry. Grapes, typically grown in some of those drier regions, are the state's second-leading commodity, produced at more than 300,000 tons a year. Among orchard crops, meanwhile, almonds represent the state's leading export.

#### 'Difference Day' challenge nets 4,392 diapers



LOTS OF DIAPERS — Posing with diapers collected as part of "Make a Difference Day" are, from left to right, Glenda Ross, Dewayne McDowell, Donald Herron, Joanne Lombardi, Ray Ng, and Joan Funkhouser (all 2256). Seated is Diane Gottwald (8528).

For the California Site's first participation in "Make a Difference Day," Public Relations and Communications Dept. 8528 challenged departments to donate disposable diapers — hoping to receive up to 1,000.

As the final days of the contest approached, Glenda Ross organized her Design Definitions Dept. 2256 to double the existing total, collecting about 1,300. The final amount, more than 4,000 diapers overall, was divided among three Livermore-area shelters. At the Tri-Valley Haven, employee Mike Ducey said he was amazed with the response. Normally, he said agencies such as the Haven and the other two recipients — Family Crisis Services and Shepherd's Gate — constantly run short of disposable diapers needed by the

families they serve.

One participant even donated disposable wipes as well, commenting that he was glad his family has never gone in need. Joan Bersie (8528) gathered 4,392 diapers in all — helped by publicity posters that featured a sweetly smiling infant, graphic artist Gregg Andreski's (8528) niece.

Like Glenda, individuals in several departments stepped forward to spearhead contributions. The winning department received a \$50 gift certificate for a team celebration at Round Table Pizza.

The packages of diapers in the photo were an early contribution for the next drive, Joan said — the Holiday Spirit campaign.

### Nanotechnologies

(Continued from page 1)

researchers from abroad. "People we hadn't accepted appeared at the door, apparently under the assumption that if they traveled a long distance and just showed up, we wouldn't turn them away," says Terry. Hotel capacity regulations limited official attendance to 168.

The 80,000-square-foot Center is expected to be located outside Kirtland AFB north of the Eubank gate and west of the Research Park on DOE-owned land. It will be open to researchers — visiting scholars, postdoctoral associates, graduate research assistants, and undergraduate interns — from around the world who have received appropriate DOE approval, says Terry.

Sandia and Los Alamos researchers who could not attend the workshop will be briefed at their respective labs in meetings to take place before the holiday break.

#### \$400 million doesn't get you in door

The amount authorized by DOE to build two facilities — \$45-\$50 million in Albuquerque for CINT's core facility, \$15-\$20 million at Los Alamos for a CINT Gateway — is not a large amount on the world stage, where European countries and others have committed hundreds of millions of dollars to construct

of millions of dollars to construct and staff similar centers. What CINT will have that these centers do not is access to already-inplace facilities that, says Terry, dwarf what almost any new center could marshal. "Four hundred million dollars doesn't even get you in the door," he says.

These include, through deliberately constructed "gate-ways" into the two national labs, access to Sandia's Microelectronics Development Lab and Compound Semiconductor Research Lab, as well as its capabilities in materials synthesis, scanning probes, and theory and simulation computers and personnel. Access through the gateway to Los Alamos means connections with LANL's biosciences resources, its National High Magnetic Fields Lab and Neutron Science Center, its scanning probes, and its theory and simulation centers.

The "gateways" are not mere terms but physical locations — at Sandia, Bldg. 897, and at Los Alamos, to be built — at which outside personnel can write proposals and conduct research with CINT staff.

At the core facility off Eubank Blvd., office



suites for staff and visitor accommodations will include computer bays and communication links in 15,000 square feet of space. The core facility will also include wings in which to perform nanomaterials synthesis (15,000 sq.ft.), characterization with isolation from vibrations (15,000 sq.ft.), and a Class 1000 clean room with flexible fabrication facilities (14,000 sq.ft.) at which to integrate designs. The core research group will include approximately 40 in-house researchers, 100 researchers from universities, industry, and other

"People we hadn't accepted appeared at the door, apparently under the assumption that if they traveled a long distance and just showed up, we wouldn't turn them away."

locations at the two national labs, 40 postdocs, and 40 undergraduate students.

#### Several surprises along the way

The road to acceptance of the Sandia/Los Alamos proposal was not without surprises. After the White House Office of Science and Technology Policy initiated a National Nanoscience Initiative in January 1999, and DOE's Basic Energy Sciences office recommended establishing "nanocenters," five groups submitted construction bids. One, Argonne National Laboratory, had already received a substantial promise of funds — \$37 million — from its home state of Illinois. Still, when the independent evaluation was completed, Argonne was not rated among the top three, though hopes were high for next year.

Brookhaven National Lab also did not make the cut. Other "nanocenter" proposals selected were from Lawrence Berkeley and Oak Ridge national laboratories.

A Sandia/Los Alamos/University of New Mexico bid was accepted — with the proviso that UNM be dropped from the governing board of the Center, because CINT's charter is to be open impartially to researchers from every university. UNM's position as a governing entity would, politicians from other states decided, give it an unfair advantage. The University of New Mexico agreed to remove itself from its governance position in the CINT proposal, but plans to be an active participant in CINT. The Sandia proposal cadre consisted of Charles Barbour (1112), Jeff Brinker (1846), Bruce Bunker (1140), Terry, and Jerry Simmons (1123).

#### Getting nanoscience out of the beaker

CINT is expected to have four areas of expertise: photonics lattices and quantum clusters; complex self-assembling nanostructures; the mechanics of behavior at the nanoscale; and importation of biological principals and functions into nano- and microsystems.

While research at such tiny dimensions may seem removed from usefulness in the macroworld, a billion times larger in scale, some clues come from biology. "Living systems use nanodevices all the time," says Terry. "An ele-

phant starts out as a collection of nanomachines. The reason a person can take notes at a lecture is that molecules travel along protein walkways that nature organized into an architectural system that allows you to manipulate a pencil. Nature starts with molecules and chemical pathways, and then integrates mol-

ecular machines into larger structures — cell membranes, mitochondria — that organize into cells at the micron level, and these cells into tissues "

"Our mission at CINT is not just nanoscience," he says. "It's to lay the scientific groundwork for future devices that will change our lives. We have to be on the boundary where science is converted to technology." Just the same, he says, "we need to explore and develop the basic science. We don't even know what the architecture of these larger systems is or what the principles are that govern it. A little nanowalker can't do anything until integrated into the next level of structure.

"Our challenge is to get nanoscience out of the beaker and into the world around us."

# Al Zelicoff's bioterrorism testimony to Congressional committee urges nation's leaders to adopt public disease monitoring system

Labs senior scientist Al Zelicoff testified Nov. 1 before the US House Oversight and Investigations subcommittee about the urgent need for the nation's hospitals.

nation's hospitals and medical clinics to adopt an Internet-based disease reporting system that would alert public health officials at the first signs of symptoms that signal a bioterrorism incident.

Sandia originally developed such a system, called RSVP for Rapid Syndrome Validation Project, as a way to verify "What we realized about two years ago is that good health surveillance is also good counterterrorism against biological weapons."

that nations are complying with biological weapons treaties.

But long before the anthrax scare in the US, Al had been advocating the widespread adoption of RSVP by medical clinics across the US as a way to quickly identify outbreaks of unusual diseases, either intentionally introduced into a population or not

"What we realized about two years ago is that good health surveillance is also good counterterrorism against biological weapons," says Al.

The system, essentially Internet-based software that allows individual physicians to quickly and easily report symptoms they think are unusual, automatically alerts public health officials when clusters of symptoms indicate a possible outbreak of infectious disease, allowing them to respond quickly.

A prototype version of RSVP is in use in three New Mexico hospitals and clinics and is linked to the New Mexico Department of Health.

The testimony included a brief demonstration of RSVP.

Al, a physicist and M.D. by training, spent a decade practicing internal medicine before joining Sandia's Center for National Security and Arms Control 12 years ago. His interest is preventing biological weapons proliferation. He has served for nine years as an advisor to the US delegation to the Biological Weapons Convention.

Several other Sandians have been involved in RSVP's development, including Susan Caskey (5329), Ren Salerno (5324), Greg Mann (5327), and Rebecca Frerichs (5324).

Excerpts from Al's presentation follow. The full text of his testimony can be found at http://www.sandia.gov/testimony/test\_hom.html.

— John German

#### **Excerpts from testimony**

"We, as a country, have not taken the biological weapons proliferation problem seriously, and we have squandered important opportunities in the international arena to strengthen norms against the acquisition and use of biological materials as weapons. . . .

"But more important, Mr. Chairman, is that our public health systems and traditional medical care delivery systems are minimally prepared to detect the early manifestations of disease that is intentionally introduced into a community....

"In any biological weapons attack, large or small, hours matter. . . .

"In my ten years of medical practice, I never—not once—saw a physician or physician's assistant pick up the phone to report a so-called 'reportable' disease . . . Why? The process is burdensome, inefficient, and most importantly, almost never gives anything back to the physi-

(Continued on next page)

### Threat assessment

(Continued from page 1)

as a function of time following its release, producing a movie that gives researchers a view of agent transport and concentration. Simulations include a variety of agent release scenarios using real properties for a number of chemical and biological materials.

#### Modeling applied to several facilities

This modeling capability has been applied to several facilities, including an eight-story federal courthouse, a mil-

itary command and control center, and a large airport terminal building.

And since
Sept. 11 Richard
has received
numerous
inquiries from
government agencies and others
about how to
assess the
chem/bio threat
and the vulnerabilities of their
buildings.

"There are a lot of things we can do to make sure that buildings in America are safe from chemical and biological agent attack. These modeling and analysis tools can play a key role."

The informa-

tion produced by the computer simulations becomes extremely valuable in determining cost-effective mitigation strategies, figuring out where to put agent detection sensors, sensor performance requirements, and deciding on cleanup and decontamination tactics.

In the area of mitigation, for example, the simulations might provide insight as to whether some or all of the air handlers should be turned off in a contaminated building, if it would be effective to purge out the contaminated air and pump in fresh air, if it might be possible to contain or isolate the agent using the HVAC (heating, ventilation, air conditioning) system, or if filters or neutralizers should be used. The benefits of any given mitigation strategy can be assessed to help pick the most useful or cost-effective approaches to protecting the building.

The modeling data could also guide the optimal placement and use of the sensors used to detect chemical and biological agents.

"These new sensors are expensive, and may

have significant installation and maintenance costs," Richard says. "If you can have only five or six of them to help protect a large building, you have to figure out the most effective places to put them."

The question then arises of how sensitive the sensors must be and how fast must they respond. For example, asks Richard, would a sensor with a fiveminute response time help and where would fast or slow sensors be appropriate? What sensor sensitivity is needed to effectively protect the building by initiating active

responses? The modeling and simulation tools help to answer those questions.

Cleanup and decontamination efforts could also benefit from computer modeling. The models can predict agent deposition on floors, walls, ceilings, ducts, and other surfaces in every room of the building, telling researchers where the agent could go and what areas of a building could be the most contaminated. The information could allow cleanup efforts to be focused on the most contaminated areas, giving insight about where cleanup efforts should begin and where they are less needed.

#### "Smart building"

Finally, Richard says, the modeling and analysis tools are critical technologies in creating a "smart building," one that integrates sensor information and observations from human security to "know" what is happening in and around the building, and then uses predictive modeling and decision-making algorithms to chose the most effective responses to protect building occupants. When sensors detect the presence of an agent, a "smart building" would chose the best HVAC system response to create clear evacuation paths or areas of the building where occupants could take



RICHARD GRIFFITH studies blueprints of a building to better understand airflow. He has led a team that developed modeling and simulation tools for assessing the threat and vulnerability of buildings to biological and chemical assaults. This includes looking at how these agents move and are deposited inside a building. (Photo by Randy Montoya)

shelter, provide real-time instructions to occupants and first responders, and minimize the amount of the building that was contaminated.

"There are a lot of things we can do to make sure that buildings in America are safe from chemical and biological agent attack," Richard says. "These modeling and analysis tools can play a key role."

#### Sandia team

Members of the team working on the modeling and simulation project for assessing the threat and vulnerability of buildings are John Brockmann (9117), Ken Murata (6415), Fred Gelbard (6233), Charles Hickox (9117), Donna Edwards (8112), Susanna Gordon (8112), Bill Wilcox (8112), Frank Dempsey (9116), David Lovato (9117), Virginia Whisnant (former student intern in 9117), Tony Geller (6233), Carl Leishman (14111) Tim Wiseley (2983), Sharlene McLane (2334), Ron VanTheemcsche (2991); and Ron Dykhuizen (9116).

### Zelicoff

(Continued from preceding page) cian that is of relevance to the patient she is caring for. . . .

"You may be surprised to learn that the repository of knowledge regarding infectious diseases resides not with the primary care physician but in local (and I emphasize local) public health officials. These highly trained specialists . . . know by dint of their long experience the patterns of diseases in their area — which viruses are normal, what microbes are unusual, what seasonal course diseases take. . . .

"What is required immediately (actually, it has been required for a long time) is an inexpensive tool that will establish and maintain communication between overworked clinicians and out-of-reach public health officials. The tool must be easy and intuitive to use, ubiquitous, very fast, and sustainable in its own merits. . . .

"We at Sandia were able to show that if public health authorities can be apprised of the earliest cluster of illness that occurs a few days after a large-scale bioterror attack (rather than at the time of first death or even the time of first positive laboratory test result), the vast majority of people exposed — even to anthrax and smallpox — can be saved. . . .

"Equally important  $\dots$  is that the system can show whether there is widespread exposure, or

instead, that it is likely to have been more localized. This is critical information for decision makers. . . . Reassuring the public with substantive knowledge of the limits of exposure will make all the difference in the use of resources should there be a large-scale dissemination, and in the degree of disruption to our lives should the use of decidedly low-tech but nonetheless terror-inducing dissemination of anthrax by mail be repeated."

"I don't purport that syndrome-based surveillance is the complete answer to our bioterrorism problem. . . . What it does do, however, is provide an easy, inexpensive way to get the real experts (public health officials) the data they need to decide whether or not a disease outbreak investigation is warranted at the earliest possible time, well before our laboratory-based surveillance system would alert them to serious disease in the community. It also gives back to physicians something useful in the bargain."

Al ended his testimony by expressing his support of the Bush Administration's rejection of a proposed Biological Weapons Convention protocol that Al says would "provide easy refuge for cheaters and place unacceptable burdens on US industrial and military facilities."

Al then urged the committee to, when the time is right, appoint a negotiator whose goal is to establish an electronic international system of disease monitoring.

### President Bush nominates Sandian Margaret Chu to rad-waste post

The White House announced that President Bush plans to nominate Sandia's Margaret Chu to serve as director of the Office of Civilian Radioactive Waste at the Department of Energy. The nomination requires approval by the US Senate

Margaret is currently director of the Labs' Nuclear Waste Management Program Center 6000. She has worked at Sandia in several capacities since 1980, including positions as manager of the Environmental Risk Assessment and Waste Management Department and deputy manager of the Waste Isolation Pilot Project and Technical Integration Department.

She earned an undergraduate degree from Purdue University and a PhD in physical chemistry at the University of Minnesota.

## Pentagon cleanup no picnic, says Sandia team leader

'I was trained to do a job and I did it,' says Bruce Berry. 'I put my emotions in the cold zone.'

By Neal Singer

The easiest part for Bruce Berry (3115) in describing his excavation work at the Pentagon in the week following Sept. 11 was the engineering details. A big man, he sits back in his chair and describes co-leading a team of 62 New Mexicans (five Sandians) onto a C-17 military transport, along with 57,000 pounds of equipment, to fly at 41,000 feet at 650 mph to land at Andrews Air Force Base outside of Washington, D.C., in a trip that lasted three hours and fifteen minutes instead of the normal five hours. The team sat in canvas chairs bolted to the side of the plane; the equipment sat on eight, eight-foot-cubed pallets in the center of the aircraft, which was so huge there was room for more goods. Standard procedures demand the group take everything it might need without relying on the area to which it may be sent. They took cots, lights, generators, doctors, food, kitchen equipment, showers, water heaters, as well as gas, oil, water, drills, support stanchions, airbag heavy lifters, and much more. The team was alerted on Sept. 13, activated on the 15th, palletized their equipment on the 16th, and flew to Washington on the 17th.

It was the first deployment under dangerous conditions for the New Mexico FEMA [Federal Emergency Management Agency] group called the New Mexico Urban Search and Rescue Task Force, and their name is what they did. Working 18 hours a day (including travel time to sleeping quarters), they got done in four days what was supposed to take six: they shored up damaged parts of the five-story military center — 40 columns on the first floor, 15 on the second — and searched with sensors and dogs for still-alive victims. When they found body parts, the FBI took them. When they found airplane parts, the FAA inspectors took them. They used cranes to haul Bobcats through second floor windows to clear debris.

"We were pretty sure we weren't going to find anyone alive," Bruce says. They didn't.

On the bright side, if you could call it that, the Pentagon, constructed in the late stages of World War II, was built to survive attack. It did. Damage



MEMBERS OF the New Mexico Urban Search and Rescue Task Force clear rubble at the Pentagon in the wake of the Sept. 11 terrorist attack.

was restricted chiefly to its outer ring, kept within a space 45 feet deep, 70 feet wide, to all five stories. Fireproof doors restrained the spread of fire horizontally from the spilled jet fuel.

In another stroke of good luck, "The [section of the] building to the right of the impact had been recently renovated, and the people hadn't yet moved back in," Bruce says. "Everything to the left was in process of evacuation for renovation. So the plane hit a relatively unpopulated area of the building."

Still, the mess was considerable. "Imagine a plane coming through your office," says Bruce. "Everything falls in: the roof, the subroof, air conditioners, lights, wiring, subwalls, whiteboards, computers, printers, pictures, everything. The debris could be anywhere between three feet and eight feet deep."

"You find remains," he says. "It's hard to talk about. It brings back the vision."

While he worked, he says, "I was on automatic pilot. I was trained to do a job and I did it. I put my emotions in the cold zone. A lot of people in Vietnam did that. When you come back to civilization, you come out of the cold zone and have to deal with what you saw. It's hard to put into words."

He goes back to technical details. The temperature was 80 degrees, the humidity was 85 percent, his group is working with half-face, cannistered masks, long-sleeve shirts, overalls, leather rather than plastic gloves (leather protects against sharp objects but unfortunately absorbs moisture), and steel-shanked steel-toed boots. No one can eat, drink, chew, or smoke in the hot zone. Clothes and boots have to be decontaminated on every break. There are three levels of vehicle security to get to the parking lot, two more to get to the site and one final check before getting into the building and the actual worksite. "There's an odor — a unique odor of death at every death scene," Bruce says, knowledgeable from other volunteer experience rescuing people in the wilderness for the New Mexico Department of Public Safety.

The New Mexico group was one of five FEMA teams called out to assist at the Pentagon. The other Sandians were Troy Hamby, Lloyd Rantannen (both 3333), Mike Hessheimer (6420)), and Gerald Wellman (9123).

Asked how he feels about all this, Bruce leans forward. "A part of you is being affected by what you see," he says. "You can't help feeling anger or hate that this act was done. Of course, you can't dwell on that because you are there to do a job. But you come across remains and you wonder, whose mother was this? Whose son?

"You may find a pair of running shoes under a desk. A sweater on a chair. A fishing bobbin on a file cabinet. You see a picture of someone's family in a frame. You start personalizing. Then you realize you shouldn't do that and you must get back to work."

"Critical incident stress debriefing" sessions after the experience gave the group the time to talk about what they saw and felt, in order to deal with it. Bruce compares it to Vietnam syndrome (post traumatic stress disorder). "You may feel like sleeping all the time, eating too much. You may feel people don't understand you anymore, or you may sit in your office and suddenly start crying. All these things are normal because of the stress. You put all that you saw, heard, smelled, lived, in cold storage so you could work and it wouldn't affect you, but it comes out later," he says.

Despite the labor, hours, and stress, the real heroes, he says, were the members of the local fire departments, Arlington Fire Department and Alexandria County Fire Department. "They were there when we came; they were there when we left," he says.

He stops one more time. He says, "After all the smoke and hubbub, you just have to find time to dig out [from the experience] and put it in perspective. The hardest part for me is that there are not words in my vocabulary to explain what we went through. It was a very humbling experience."



ON THE SCENE — Rep. Joe Skeen, R-N.M., meets with members of the New Mexico Urban Search and Rescue Team at its on-site headquarters at the Pentagon. Bruce Berry (3115) is second from right.





THE *TIME* HAS COME — In a special feature section in the Nov. 19 issue of *TIME* magazine highlighting the best inventions of the year, the editors selected Sandia's itsy-bitsy MARV Jr. robots (*Lab News*, Jan. 26) as one of the most impressive achievements in 2001 in the field of robotics. MARV Jr. (the Mini Autonomous Robot Vehicle Jr.) was developed by Ray Bourne (15211), Ed Heller (1763), and Doug Adkins (1764). *TIME* editors asked *Lab News* photographer Randy Montoya to photograph the robots individually on a nondescript background — those are the images to the right. The editors liked Randy's earlier *Lab News* photo of Doug Adkins with a bevy of the robots so much that they decided to include that photo as well.

# K-9 camera project gives one Sandian closeup view of nightmarish scene at New York City's Ground Zero

#### 'I was just honored to get the call' to help

By John German

Few Sandians get to see their R&D work put to direct use in the real world. Fewer still get to help deploy it on the battlefield.

Richard Sparks did.

Beginning Sept. 15, Richard (5831) spent 22 days at "Ground Zero" — the pile of rubble in lower Manhattan where the World Trade Center used to stand.

His mission was to help urban search and rescue teams from across the country, working around the clock at Ground Zero, outfit their search dogs with wireless low-light video cameras and two-way radios attached to special collars carried by the dogs.

As the dogs scrambled in and out of tight and sometimes dangerous spaces in the rubble looking for victims — or, in the case of the World Trade Center, their remains — each dog's K-9 camera transmitted video images and sound (via RF signals) to a



RICHARD SPARKS (5831) displays his "K-9 cam" transmitter and LCD TV monitor/receiver. The system was used by search and rescue teams deployed at Ground Zero in Lower Manhattan. (Photo by Randy Montoya)

hand-held unit including a video screen, two-way radio, and video recorder held by the dog's human handler above the rubble.

Using Richard's camera and radio kits, the handlers could watch for victims, hear their movements or calls, and issue radio commands to the dogs.

#### **Unexpected application**

Richard had been developing the RF camera collars and receivers since April as part of a National Institute of Justice-funded project to assess whether K-9 cameras could assist police SWAT teams during hostage negotiations and rescues.

NIJ funded the project in part because police teams responding to the April 1999 attack on Columbine High School lacked information needed to respond swiftly, delaying their entry into school buildings. NIJ wanted to know whether K-9 cameras could provide the needed information, and perhaps save lives of hostages, without putting police officers in harm's way.

A few days after the World Trade Center towers collapsed, Richard got a call from the NIJ's technical support unit on site in Manhattan. NIJ asked if Richard could come to New York immediately to assist the Federal Emergency Management Agency (FEMA) Urban Search and Rescue Division during the World Trade Center rescue and recovery operation.

NIJ program manager Gordon Smith (5861) authorized use of NIJ funds to support the effort.



CAMERA-READY — Search dog at Ground Zero of the 9/11 attack is fitted for a TV camera and transmitter.

"It was the first time I had thought about using K-9 cameras for search and rescue," says Richard. "All we had at that point was a hastily designed prototype. But I said we'd try."

#### Collars used around the clock

Richard had just enough equipment on hand — with a few last-minute purchases — to cobble together six K-9 camera/receiver kits.

The next morning he boarded a DOE Lear jet in Albuquerque, which transported him and 600 pounds of equipment to Andrews Air Force Base near Washington, D.C. He was transported by van to New York City.

He assembled the collar/receiver kits en route and on scene in New York.

Over the next 22 days Richard supported urban search and rescue (US&R) crews from every state as the teams rotated in and out of the rubble. Sandia's six collars were in use essentially 24 hours a day.

The US&R teams were standing in line to use them, he says.

Unfortunately, no one was found alive, but the dogs did locate the remains of many. (See "Richard Sparks wants horrifying scenes at Ground Zero to inspire solutions," above right.)

#### Low-tech equipment, bright future

In one particularly poignant effort, according to rescuers, a dog outfitted with a K-9 camera discovered the remains of a group of New York City fire-fighters. Rescuers used the images to find a place in the rubble where workers could punch a hole

through a concrete slab, far enough away from the firefighters to avoid disturbing their bodies, yet close enough to recover them.

Richard worked 15- to 20-hour days, maintaining the camera kits and training rescuers to use them. Part way through Mary Green (5861) joined him, allowing Richard to catch up on some sleep.

The K-9 collars and receivers aren't what you'd call hightech. Most of the equipment is available commercially. Still, the real-life situation provided Richard with valuable information about the K-9 camera's potential uses and drawbacks.

He redesigned the

#### Richard Sparks wants horrifying scenes at Ground Zero to inspire solutions

Richard Sparks (5831) says what he saw at Ground Zero he will never forget. The scene jolted him with the sudden realization that this nation is at war. The remains he saw were those of American civilians.

Richard spent a lot of his time at Ground Zero taking photographs with a digital camera. He brought home more than 1,000 frames.

He also met FEMA photographer Michael Rieger at the disaster site. A few of Rieger's photos are published on the next two pages. More of Richard's and Rieger's photos of Ground Zero are temporarily on display in the Bldg. 802 Lobby.

Although he shies away from publicity, including this *Lab News* article, Richard thinks it is important for Sandians, by definition intimately involved in this nation's security, to see images of the devastation at Ground Zero and be reminded why their work is so important.

"Sandians have the technological muscle to say, 'No way, no one is going to do this to us again,' " he says. "I want this to inspire people here to come forward with their creative ideas about how to prevent this kind of tragedy from happening in the future."

collars on the fly, using duct tape to customize tearaway Velcro collars tailored to each dog's size and weight so the dogs wouldn't get hung up on jagged edges. He thinks future versions of the collars could include gas and temperature sensors that would allow handlers to keep the dogs out of dangerous spaces.

Many of the search and rescue teams wondered where they could get their own K-9 camera kits. Based on conversations with team members, Richard estimates an initial need for 5,000 of the kits, 2,000 in California alone where earthquakes are a real concern.

He is now looking for a company to put together the kits. He's also trying to find funding for Sandia to build 50 rapidly deployable K-9 camera kits for use during future national emergencies.

Despite the 15- to 20-hour days and the terrifying memories, Richard says he was glad to be able to assist the rescuers. "I am sure any Sandian would have done anything they could to help in this situation," he adds. "I was just honored to get the call."



CAMERA-EQUIPPED search dog and its human teammate explore rubble of World Trade Center in New York. The K-9 cameras developed by Sandian Richard Sparks were used around the clock in the search and recovery mission at Ground Zero.

### DAKOTA

(Continued from page 1)

their product design or impact their research.

Written in the C++ computer language, DAKOTA provides a flexible interface between the designer's simulation software and the latest algorithms for optimization, uncertainty quantification, parameter estimation, design of experiments, and sensitivity analysis. Interfaces between DAKOTA and user simulation codes can be developed rapidly. To date more than 20 simulator programs have been interfaced with the software.

One of DAKOTA's key features is its ability to use parallel computing resources. For example, DAKOTA was recently interfaced with the SALINAS structural dynamics computer code as part of DOE'S Accelerated Strategic Computing Initiative (ASCI) milepost.

#### Powerful algorithms

"DAKOTA and SALINAS performed a large weapon component design study on 2,560 ASCI Red processors that accomplished in four days what would have taken more than 10 years to complete on a single workstation," says Mike Eldred (9211), principal investigator.

With its powerful algorithms and ability to manage complex simulations, DAKOTA allows designers to develop virtual prototypes of products that can be modified within the computer to minimize weight, cost, or defects; limit

"DAKOTA and SALINAS performed a large weapon component design study on 2,560 ASCI Red processors that accomplished in four days what would have taken more than 10 years to complete on a single workstation."

critical temperature, stress, vibration, or other responses; or maximize performance, reliability, agility, and robustness. The result: better designs and reduced dependence on prototypes and testing, which shortens design cycles and lowers development costs.

Sandia researchers have been developing DAKOTA for about eight years. Starting out as a Laboratory Directed Research and Development (LDRD) program, the initial work focused on optimization methods, but has since branched out into uncertainty quantification and other areas. It has been used internally by analysts from Centers 9100, 9200, 15200, 8700, 2100, 2300, and 2500 and externally by researchers at Los Alamos and Lawrence Livermore national laboratories in conjunction with DOE's ASCI program.

In addition, 15 industrial companies and universities have been granted DAKOTA licenses under the old licensing system.

Now this sophisticated and flexible engineering software will be made available free to virtually anyone who wants it without the hassles of custom licenses.

#### **DAKOTA** unique

"Some commercial products exist that allow users to do optimization, but there are a variety of features that make DAKOTA unique — like having the ability to use thousands of processors," Mike says.

Other unique features include support for surrogate-based optimization, optimization under uncertainty, mixed integer nonlinear programming, and simultaneous analysis and design, all of which are useful tools for real-world engineering applications.

There are several reasons for making DAKOTA readily available. It will encourage collaborations between Sandia, universities, and other research organizations. This will help infuse the latest research in optimization and related areas into DAKOTA.

Also, the public release will give the software more exposure and use. That is beneficial because as more people use the software, they will identify problems and contribute enhancements that can be shared with the user community. This expanded use could extend to commercial software companies as well — several software vendors have expressed interest in using DAKOTA services along with their proprietary software systems.

"The only restriction is that people cannot take the DAKOTA software, change it, and then sell it," Mike says. "They can, however, design products with DAKOTA and sell their products."

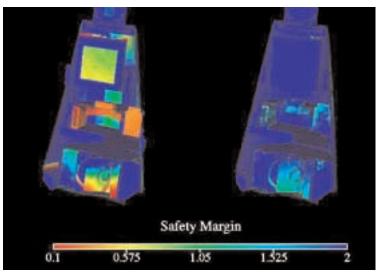
### Si Feedback

#### Please keep us posted on pension plan issues

**Q:** We saw a blurb in the Daily News stating that a retirement improvement plan package was submitted to DOE. What has happened since? Can you tell us anything about the improvements being sought? Please don't tease us, and then keep us in suspense for weeks. At least give us regular updates even if they are light on detail.

A: Sandia's management has had several discussions with DOE and supplied them with additional data since we submitted a proposal in early August to modify the Retirement Income Plan. We are unable to share any details of the proposed changes because DOE is still actively reviewing the proposal. We hope to receive a response from DOE on our proposal within the next several weeks. If we do not receive an answer from them within that timeframe, we will publish an announcement to update employees.

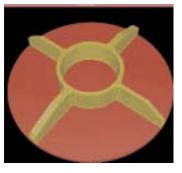
— Ralph Bonner (10300)

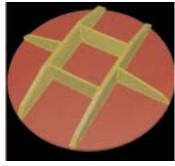


#### **DAKOTA Simulations**

In the upper illustration DAKOTA optimizes models of weapon components using Sandia software such as PRONTO3D and SALINAS. A comparison of safety margin contours for an initial electronics package design (upper, left), and the optimized design (upper, right) is shown. The initial design violated allowable response levels by a factor of two, whereas the optimized design removed all violations and still met strict weight targets. The illustration at right shows candidate reinforcement concepts for a radar load spreader. DAKOTA optimized each of these designs, allowing for rational comparison and informed selection.







The expected positive result will be an improved software toolkit that will be even more efficient and capable for supporting Sandia's mission.

DAKOTA is a flexible software that can be used both on massively parallel computing platforms that have thousands to tens of thousands of processors and on a single workstation or a network of workstations. It has been successfully ported to most common UNIX-based workstations including Sun, SGI, DEC, IBM, and LINUX-based PCs.

Technical manuals have been prepared to help walk DAKOTA users through the software. Also, the DAKOTA team has begun giving tutorial workshops and expects to do more as the software is publicly released.

Many engineers and researchers around the country are already awaiting the open source release. These "friendly customers" will be given the first access to the software and will serve as testing sites.

"We'll let them download it and help us work out the kinks in the new process," Mike says. "Then when we feel completely comfortable with it, we'll open it up for total public access."

Download information is available from http://endo.sandia.gov/ DAKOTA, and the DAKOTA team can be contacted via dakota@sandia.gov.

#### DAKOTA team members

Core DAKOTA team members are Mike Eldred (9211), Tony Giunta (9211), Bart van Bloemen Waanders (9211), Steve Wojtkiewicz (9124), Bill Hart (9211), Mario Alleva (9211), and Roscoe Bartlett (9211). Providing a critical influx of the latest algorithms into the DAKOTA framework are the SGOPT, PICO, OPT++, DDACE, APPS, DAKOTA/UQ, and rSQP++ library projects. Contributors to these projects include Cindy Phillips (9211), John Red-Horse (9211), Juan Meza (8950), Pam Williams (8950), Patty Hough (8950), Tammy Kolda (8950), Leslea Lehoucq (8950), Kevin Long (8950), and Paul Boggs (8950), as well as Prof. Roger Ghanem (Johns Hopkins University), and Prof. Jonathan Eckstein (Rutgers University).

# A flag across the nation: Sandia runners join in effort to help complete the itinerary of doomed 9/11 flights

By Bill Murphy

John Yip's a realistic guy. Patriotic, but realistic. That's why, at 57 years of age, the fabulously fit Vietnam vet and long-distance runner (photo on page one) realized that his first impulse in the wake of the Sept. 11 military attack — to re-enlist in the US Army — wouldn't fly.

"If this was 10 years ago, I'd go and see what I could do for my country, but let's face it, the Army doesn't want guys my age."

Like so many Sandians, like so many Americans, though, John felt an overwhelming need to somehow express his deep and abiding love for country. That's why, when he heard about the United Airlines/American Airlines project to run a US flag across the country from Boston to Los Angeles — the aborted flight itinerary of two of the aircraft hijacked in the Sept. 11 attack — he knew he had to get involved.

(For details about the Oct. 11-Nov 11 Flag Run, see the national web site at http://www.flagrun.org)

"After the shock and the anger, I saw this [flag run] as a chance to show my true colors," says the 20-year Sandia veteran. John, along with more than 20 other Sandians, signed on as a runner. On Nov. 3, as part of a rather informal team of runners, he helped carry the flag through a 29-mile stretch between Moriarty and Albuquerque. Other Sandians were part of teams that ran legs all across the state, from Fort Sumner to the VLA, way out past Magdalena. Other Sandians were part of the logistics support groups that made the Flag Run possible. All in all, thousands of runners from all across America, of all races, creeds, colors, and walks of life.

Carrying the American flag in a unifying event has a special meaning for John. He was born in China and raised in Thailand before coming to the US at age 18. "Where I grew up, you couldn't criticize the government," he says. Shortly after arriving in America, he joined the Army and served in Vietnam — his service expedited his citizenship application. John says he was proud to serve then and would consider it a privilege to serve again — if the military would have him.

"You ought to give something back to the country that has given so many opportunities," he says.

Although John knows that carrying the flag down a long stretch of road in rural New Mexico isn't the same as fighting for the flag on a foreign shore, he does see it as real service.

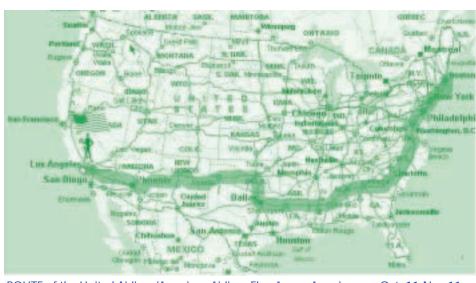
"We're showing the world what America means," he says. "Sometimes it takes a tragedy of a global

kind before you get everyone to start bonding or gelling as a group, but that's what's happening now. We're showing that when we need to be united, we can set all of our bickering aside and stand behind the flag.

"I'm really honored to get to do this," he says. Here's what John wrote about his personal experience in carrying the flag. It's posted on the flagrun.org web site, along with the accounts of dozens of other runners.

The first time I received the flag, it was such an adrenalin rush. . . Just as I was getting comfortable, someone new joined the run. It was my friend Francis Chang, who came down from Denver to joined me for this epic event. Then Chowdy Tusiri, Natasha Ning, and Isabelle Chang all joined me for part of the run. I was so glad that my friends could join me and get to hold the US flag, a symbol of American unity.

As I was carrying the flag up Sedillo Hill, people were lining up on both sides of old U.S. 66, clapping, cheering, and smiling for us to keep going. The sun was out and not a cloud in the sky, what a great day to be alive and be an American. . . . I felt so privileged to get to carry the U.S. flag for this momentous occasion. I did not slow down again until I crested Sedillo Hill.



ROUTE of the United Airlines/American Airlines Flag Across America run, Oct. 11-Nov 11.

### Sandia flag runners



BRINGING AMERICA TOGETHER — Chris Miller (12640, second from left), stops in front of the Yeso Post office for a photograph with other members of the team that ran the US flag from Ft. Sumner to Yeso. Chris was one of the many Sandians who participated in the Flag Across America run to complete the Boston to Los Angeles itinerary of two of the airplanes seized in the Sept. 11 terrorist attack.

More than 20 Sandians formally enrolled to carry the US flag as part of the cross country American Airlines/United Airlines Flag Across America run. Dozens more participated informally. Those who officially enrolled are listed here:

Chris Miller (12640) Ft. Sumner; Michael Coutney (14405), Yeso; Karen Rice (9523), Ron Akau (9116), Lori Dotson (6840), John Yip (3132), Dave Peterson (1738), and Catherine Rosul (1734), Moriarty to Albuquerque; Patrick and Hae-Jung Murphy (2665), Albuquerque; Diane Callow (15272) and Jeffrey Miller (10254), Isleta; Susan Brozik (1744), Jean Herbert (3333), and Douglas Deming, Belen; Dennis Muirhead (1639), Barbara Jennings (9338), Tricia Toya, Stephanie Perea (14112), and Ernie Correa (14172), Bernardo; David Goy (14408), Heather Christ (10501), and Robert Longoria (2663), Socorro; Ronda Hutchinson (2665), Magdalena; Tina Jenkin (6534), VLA Night Owl Run; Greg Long (2554), VLA to Datil.

A number of Sandians volunteered to assist with logistical support. Sandia members of the NM Search and Rescue Team who helped were Bert Tate (9329), Bob Hufnagel (14111), Rico Johnston (3112), and Bob Rieden (ret.). James Rea (5327) provided radio communications support.

A footnote to the run: Lori Dotson (6840) was so moved by the experience of her run that she and her brother decided to head west to rejoin the flag run in California. She ran legs in the remote Joshua Tree/Yucca Valley stretch and then hurried ahead to Los Angeles to run the final legs into LA International Airport.

# Ev Beckner, former Sandia VP, back in DC after stint with UK's weapons laboratory

The following story is reprinted from AWE Today, the employee newspaper at Britain's Atomic Weapons Establishment. Ev Beckner is a former Sandia weapons program VP.

Everet Beckner, AWE's [Great Britain's Atomic Weapons Establishment] Deputy Chief Executive for the past 18 months, left the Company in October to take up the prestigious role of Deputy Administrator, Defense Programs, of the United States' National Nuclear Security Administration (NNSA). The appointment is on the personal nomination of the President of the United States.

The post is the senior government position within the NNSA and Ev will be responsible for the entire United States' nuclear weapons programme — overseeing all the activities of the American nuclear laboratories and plants.

Ev was a key member of the AWE Management bid and one of the lead-in team for the new contract.

At a farewell dinner Vice Chairman John Rae paid tribute to Ev's contribution to AWE and presented him with mementos of his time in Britain: aerial photographs of Aldermaston and Burghfield sites; an AWE fleece jacket to remind him of the British weather; an Aldermaston plate to remind him of the area and a cricket bat and ball remind him that there is a sport other than baseball!

Ev later told AWE Today that he was sorry to be leaving earlier than planned but the new job was a once in a lifetime opportunity.

"One of the items high on my agenda is to

improve the relationship between AWE and the United States' laboratories. That is not to say that AWE's contribution is not currently highly regarded, particularly in terms of



EV BECKNER during a recent visit to Sandia as a member of the Sandia Corporation Board of Directors.

 $peer\ review\ and\ independent\ assessment.$ 

"However, there was inevitably greater interaction during underground testing and we no longer have that connection. So we have lost some of the valuable personal relationships that, I believe, are important to the success of the 1958 Agreement.

"I hope to re-invigorate those connections and develop new ones among our younger people. I believe it is more important than ever to have a strong relationship between our two countries."

Ev's next contact with AWE will be at this year's Stocktake, in Alberquerque in November, but then he will be on the American side of the table

# Reality check: Sandia retirees' life expectancies differ markedly from the 'Boeing' urban legend graph

By Frank Gerstle and Mark Biggs

Editor's note: For some time, a graph has been circulating around the Labs that illustrates some alarming data alleging that an employee's life expectancy declines for each year worked after age 55. As it turns out, this data is bogus but the claim has attained the status of an urban legend as it's been disseminated via e-mail and fax. The data garnered the attention of several Sandia vice presidents and directors, and VP Gerry Yonas (16000) asked Frank Gerstle to examine the data and address it. Gerry, Human Resources VP 3000 Don Blanton, and Ralph Bonner all thought it would be good to publish this analysis in the Lab News so that employees can see the results themselves. Frank is a long-time Sandia technical staff member, recently retired but working as a contractor in Advanced Concepts Group 16000. Mark Biggs is a senior planner in Pension Fund and Savings Plan Dept. 10310.

For the past year or so a graph has been circulating around the Labs that plots age at death vs. age at retirement, allegedly based on retiree data from Boeing Aerospace Company. The graph at right (Figure 1) shows a disturbing trend: for every year worked past age 55, the retiree's life expectancy drops by two years.

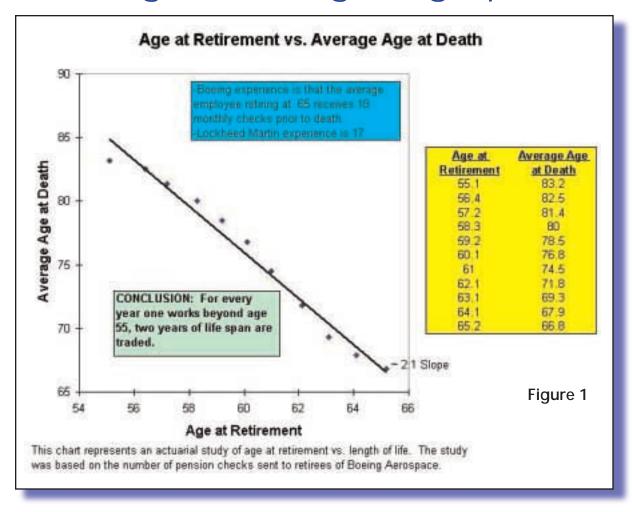
Boeing has vigorously denied that this graph is representative of its retirees. According to Julie Curtis, Boeing's Director of Actuarial Services, this graph has no basis in fact. It, and charts like it, have circulated for at least 20 years and, "although completely untrue, have become an urban legend." Curtis states flatly, "Just as important, our data show

that the life expectancy of a Boeing retiree does not depend on the age at retirement."

Sandia's Pension Department has issued similar statements and actuarial data that show Sandia's experience is exactly the opposite of that in Figure 1. The data is bogus but the claim has attained the status of an urban legend.

Nevertheless, the graph keeps resurfacing. Perhaps some of us are willing to assume the worst about our remaining time on earth.

Gerry Yonas of Sandia's Advanced Concepts Group asked that we try to resolve this matter. The actuarial approach had apparently not satisfied all skeptics. So we decided on a traditional engineering approach, to gather and present data



DON'T BELIEVE A WORD OF IT! — This is the bogus "Boeing" chart that has been circulating around the web for years and has no basis in fact. But because it keeps popping up, Sandia VP Gerry Yonas asked Frank Gerstle to examine the actual data for all Sandia retirees. That analysis is reported in this article.

for all Sandia retirees, allowing the reader to draw her or his own conclusions.

We obtained a list of retirees from the Human Resources Information Systems Department, courtesy of Lynne Powell. The list included age and date of retirement, and age at death or current age. The data cover the 50-year period from November 1951 to May 2001 for 6,671 retirees (1,184 female and 5,577 male).

To present the data in a digestible format, we divided it into four groups: Deceased Males, Living Males, Deceased Females, and Living Females. This permitted the calculation of some interesting averages: age at retirement, date of retirement, and age at death or current age. These are presented in Table 1 (below).

The data for these four groups are plotted in Figures 2 through 5 on the next page. Paul Lemke of the Manufacturing Science and Technology

Data for deceased Sandia retirees, both male and female, show a positive rather than negative dependence of age at death vs. retirement age, in direct contrast to the negative slope depicted in Figure 1.

Center aided us in the data reduction and plotting. Also shown on each figure is the linear regression trend line. For those interested, the equation and correlation coefficient for the trend line are also given.

Several observations can be made about the plots. First, data for deceased Sandia retirees, both male and female, show a positive rather than negative dependence of age at death vs. retirement age. This is in direct contrast to the negative slope of life expectancy vs. retirement age in Figure 1. Data for living Sandia retirees shows a similar positive slope of current age vs. age at retirement.

Second, the correlation between age at death and retirement age is not particularly good. The correlation coefficient is 0.37 for deceased males and 0.36 for females, indicative of the large amount of scatter at any given retirement age. One might reasonably conclude that retirement age has small effect on life expectancy other than the obvious one: if you retired at age 65, you did not die in any previous year.

Third, these data by themselves do not answer the question "What is the life expectancy of a Sandia retiree?" Table 1 gives average life spans of deceased male and female Sandia retirees. These do not provide a correct life expectancy, since many more retirees are still alive. In fact, more than half of all those who have retired over the previous 50 years did so in the last 15 years. Since the majority of those are still alive, their actual life spans have yet to be determined.

Consequently, the average life span of those who have died to date is not a good predictor of the true life expectancy of living retirees (or employees, (Continued on next page)

	Number of Persons	Avg. Age at Retirement (Std. Dev)	Average Retirement Date	Avg. Age At Death (Std. Dev)	Avgerage Current Age (Std. Dev)
Male Retirees				· ·	
Deceased	1,951	61.7	04/10/1975	75.0	
		(3.6)		(8.2)	
Living	3,626	60.2	11/01/1989		72.3
		(4.0)			(8.4)
Female Retirees					
Deceased	380	61.3	01/09/1975	77.5	
		(3.5)		(8.9)	
Living	804	60.1	06/15/1988		73.5
		(4.4)			(9.4)

Table 1 Summary of SNL Retiree Data November 29, 1951, to May 9, 2001

# Urban legend

(Continued from preceding page)

for that matter). According to the analyses done by independent actuaries, a male Sandia retiree who has attained age 65 can be expected to survive to about age 86, and a similar female Sandia retiree can be expected to live to about age 84.

We hope these data will provide enough information for each person interested in — or upset by — the urban legend "Boeing" data to determine that it doesn't apply to Sandia retirees. We also hope that each of you will live long, and prosper.

### Mi Feedback

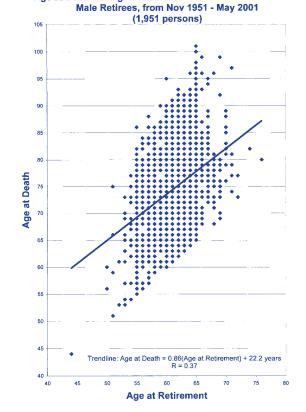
#### Employee discounts at Staples?

**Q:** A Sandia/California TNT announcement dated 2/13/2001 states that Sandia employees can get a Lockheed /Sandia discount (25%-90%) at Staples on supplies for their personal use. It further states that shipping is free if delivered to Sandia (SNL/CA). Can Sandia employees in New Mexico also get this discount from local Staples stores or those in California?

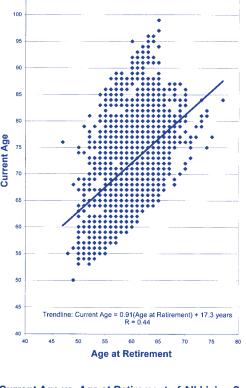
A: Thank you for your inquiry regarding the Staples discount program. This program is being offered through a Lockheed Martin Corporate national agreement with Staples National Advantage. The "established" discount for personal use (using one's personal credit card) is the same discount given to Lockheed Martin. These orders are either phoned in at the special number, 1-800-447-2525, ext. 1, or through e-mail at Porders @staples.com. Sandia's Benefits organization is currently developing a process to inform employees of all corporate and local discounts offered to Lockheed Martin employees. This will allow employees to take full advantage of discounts offered. Benefits will notify employees when the discounts page is accessible.

Sandia employees are welcome to pursue personal discounts with any corporation on their own time, using their personal resources, and their own personal method of payment. All charges for personal items are the responsibility of the employee. Sandia will not intervene in resolving disputes or conflicts resulting from personal purchases, and company resources may not be used for personal use in any discount service. This includes company mail and delivery systems. Personal items may not be delivered to Sandia/New Mexico. Delivery of personal items will be agreed to between the corporation offering the discount and the employee. Any charges including delivery for personal items are the responsibility of the employee. — Dave Palmer (10200)



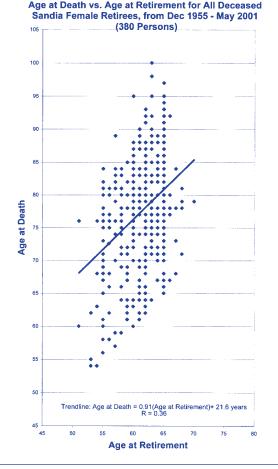


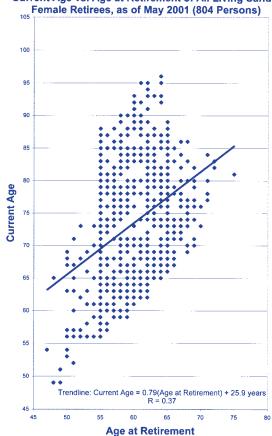
Current Age vs. Age at Retirement of All Living Sandia

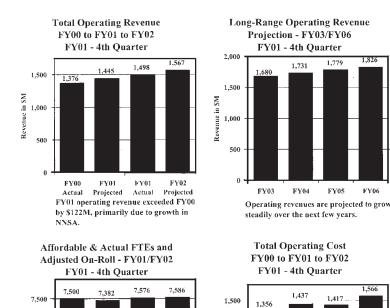


Current Age vs. Age at Retirement for All Living Sandia

Male Retirees, as of May 2001 (3,626 Persons)







FY01

Actual Projected

projections by \$20M.

FY01 FY02 Actual Projected

FY01 actual operating costs exceeded

FY00 by \$61M, but fell short of

FY01

late in the year.

FY01

FY01 on-roll exceeds affordable and

actual FTEs, primarily due to new hiring

### Spotlight on Sandia: Labs financials

Presented here is the FY01 fourth quarter report of Sandia's financial health. Chief Financial Officer Frank Figueroa (VP 10000) and his folks in the Controller's Organization 10500 developed these charts to show Sandia's financial trend data.

The chart at top left compares Sandia's total operating revenue for FY00 (actual), FY01 (projected and actual), and FY02 (projected). The July FY01 revenue projections and the October FY02 revenue projections generated by the SBUs/SMUs for Mission Council are used to update this chart. Sandia's FY01 actual revenue of \$1,498 million exceeded last year's actual revenue by \$122 million, exceeded the last FY01 projection by \$53 million, and is projected to increase by \$69 million to \$1,567 million in FY02, primarily due to growth in the Nuclear Weapons SBU and in response to the terrorism war.

The second chart (top right) compares Sandia's long-range operating revenue projections generated in October by the SBUs/SMUs for Mission Council. Revenues are projected to increase to \$1,826 million by FY06, primarily due to growth in the Nuclear Weapons SBU

The third chart compares Sandia's FY01 affordable FTEs, actual FTEs, and adjusted on-roll count along with FY02 affordable FTEs. The affordable FTEs are the latest projections generated by the SBUs/SMUs for Mission Council. Our end-of-year on-roll count of 7,576 exceeded affordable and actual FTEs, primarily due to new hiring late in the year, and leaves us well-positioned to reach our FY02 affordable level of 7,586 FTEs.

The fourth chart highlights a different aspect of Sandia's financial health each quarter. For this report, the chart compares our total operating cost for FY00 (actual), FY01 (projected and actual), and FY02 (projected). Our FY01 cost of \$1,417 million exceeded FY00 by \$61 million, but fell short of projections by \$20 million, primarily due to new hiring occurring late in the year and the impact of the Sept. 11 attack. We are projected to increase our total operating cost by \$149 million to \$1,566 million in FY02, primarily due to growth in the Nuclear Weapons SBU and in response to the terrorism war.

These charts are updated and published each quarter. They are intended to keep you informed of the Labs' financial health.

### Motivational speaker fires up OPQC conference

#### Some 320 people attend annual event

With motivational speaker Donna Hartley, survivor of a DC-10 plane crash and former Miss Hawaii, encouraging people to "Fire Up Your Life," the 2001 Office Professionals Quality Council (OPQC) annual conference last week was off to a dynamic start.

And it stayed that way throughout the entire Nov. 6-7 event — becoming one of the best OPQC conferences ever.

So says conference chairperson Sandy Culler (1746).

"It was great," Sandy says. "The feedback after the conference is that it was extremely educational and enjoyable."

OPQC conducts the conference every year for Sandia's Office Administrative Assistants (OAAs), Office Management Assistants (OMAs), Senior Management Assistants (SMAs), and Executive Assistants (EAs) as a career development activity. It also gives them an opportunity to interact with one another.

"For some, it's the only conference they attend the entire year," says Kristy Savage (3000), OPQC chair.

This year's conference was attended by 320

people over the two days. Besides Hartley as the keynote speaker, other speakers included Jim Villanucci, KOB-AM talk show host; Mike DeWitte, Manager of Corporate Outreach Dept. 12650; and David Williams, former Director of Microsystems Science, Technology and **Components Center** 1700 and currently Vice President and CEO of **Ardesta Southwest** Region.

Breakout sessions were on t'ai chi, quick and easy meals, Franklin Covey, active listening, feng shui, "smart women finish rich," hair and makeup, and selfdefense.



RELAXATION TECHNIQUE — People attending the recent Office Professionals Quality Council conference learned t'ai chi as a relaxation method. It was one of several breakout sessions during the two-day event. (Photo by Randy Montoya)

### Conference just one of many OPQC activities

Last week's Office Professionals Quality Council's (OPQC) conference is one of many activities of the organization that represents all of Sandia's office professionals.

The organization has 24 council members who are all volunteers and meet regularly. The council's mission is to provide a base for continuous improvement in the office-professional environment and promote communication and teamwork among office professionals, staff, and management through the sharing of ideas, issues, and solutions.

OPQC chair for 2001 is Kristy Savage (3000). Taking over the reins as chairperson in 2002 will be Linda Reckaway (9821).

The council consists of six teams:

- Community Outreach Team, coordinated by Paula Schoeneman (12650) with team members Bernadette Robinson (9623), Vieta Crain (1440), and Denise Taylor (1310). Over the past year the Community Outreach Team conducted a book drive for New Futures High School, provided items for the baby nursery at Carrie Tingley Hospital's Milagro Program, coordinated a school supplies drive, and coordinated the Roadrunner Food Bank drive.
- Conference Team, coordinated by Sandy Culler (1746) with team members Sue Rivas (3132), Jeanne Wallace (1740), Ginny Edmund (12650), and Linda Reckaway (9821). The team organized the recent OPQC conference.
- Information/Communications Team, coordinated by Linda Sue Smith (7002) with team member Karen Agee. The team produces an electronic newsletter, called Connections, that contains updates of OPQC activities and articles of interest to the office professionals. They also hold Infosessions twice a year.
- Mentor Team, coordinated by Laura Scott (1110) with team members Melissa Barnett (9600), Kim Goodrich (3031), Joanne

Duffy (2951), and Nancy Glenn (7001). The team makes sure that all new OAAs have mentors. This year they provided mentors to 75 new hires.

- Work Processes Team, coordinated by Sandra Smith (9512) with team members Marie Maestas (9800) and Cindy Olson (1900). The team updated the electronic acronym dictionary with the technical library, updated the SAND report guide with Tech Art, coordinated the Procurement Navigation Tool with Procurement, initiated a standardized personnel folder with Records Management, and reviewed Sandia maps for the internal web.
- Educational Outreach Team, co-coordinated by Cary de la Fe (15201) and Marie Rosales (6135) with team members Patsy Trujillo and Annette Aranda (5922). They conducted a two-day workshop for the Native American Family Conference in March; participated in the March School-to-World event; recruited through presentations and career fairs at high schools in Albuquerque, Belen, Los Lunas, and Estancia; and partnered with TVI for students to pursue associate degrees and employment at Sandia.

Also, says chair Kristy, over the years OPQC has been instrumental in improving numerous work processes that affect everyone at the labs, including: helping develop electronic time cards, electronic expense vouchers, electronic foreign travel procedures, electronic maps, JIT copier project, the recycle program, mail stop process, reviewand-approval process, SAND report guide, Informational Management Manual, OAA training reorganization, and the compressed work week.

Sandia office professionals are eligible to participate on OPQC upon completion of OAA training and placement in a permanent position. To participate on the 2002 Council, contact Kristy Savage or Linda Reckaway.

# Sandia technologies to help the injured win two awards

The "Generic Total Contact Seat" — a pneumatic cushion that permits paraplegics and others handicapped in movement to achieve increased mobility without developing life-threatening pressure sores — and the SILL prosthetics project — a smart integrated lower limb intended to mimic the action of a normal leg — have won awards from, respectively, the magazine *Popular Science* and the government-funded Federal Laboratory Consortium (FLC) for Technology Transfer, which represents more than 700 US government laboratories.

The editors of *Popular Science*, who annually review thousands of new products and technology developments, selected the Generic Total Contact Seat as one of 100 inventions fitting the category, "Best of What's New." A 26-page special editorial section highlighting these devices is the cover story for the magazine's December issue. This year is the 14th anniversary of the awards program.

The seat, developed in conjunction with the California-based medical entrepreneurial company Numotech, Inc., has generated patents for both Sandia and the company, says Sandia project manager Mark Vaughn (15252). The seat will use a series of air pumps to automatically inflate and deflate air bladders that prevent pressure sores from forming. Such sores — the results of extended immobility - are caused by insufficient blood circulation in the patient's soft tissues. The sores can become infected and result in amputations and even death. The project, sponsored by DOE's Initiative for Proliferation Prevention, allows Sandia to work jointly with the Russian company Spektr Conversion LLC, composed chiefly of Russian scientists and engineers formerly at Chelyabinsk-70. M.R. Beal, Inc., a New York investment firm, provides commercial financing.

The SILL project received a plaque on Oct. 30 in the Albuquerque Hyatt Hotel as one of the six best projects this year in the FLC's Mid-Continent Region. The project involved teaming with Spektr Conversion LLC and a US private company, Seattle Systems, in Poulsbo, Wash.

The goal of the SILL project is to design a limb system that is like a sound limb, functional and comfortable, says project manager Deepesh Kholwadwala (15222). The current method for creating a lower limb system is merely to assemble separate components (ankle, knee, and socket) together. These components do not work together in an integrated fashion. The SILL will be designed as an integrated system that should enable the limb to better simulate human gait, even on varying terrain.

Another benefit of Sandia's joint prosthetics program teaming US companies and Russian researchers formerly at Chelyabinsk-70 is the establishment of a self-sufficient core capability in prosthetics at Spektr Conversion LLC. — Neal Singer

#### For the record

#### Lockheed Martin donates \$1 million for science camps

A "teaser" box on the front page of the Nov. 2 issue of the *Lab News* mistakenly said a \$1 million Lockheed Martin donation was to the Barelas Job Opportunity Center. It should have said the donation is to a partnership made up of the National Atomic Museum,

the National Hispanic Cultural Center, and the Albuquerque Hispano Chamber of Commerce to expand its summer science camps for kids into Albuquerque's south valley. The story inside was correct.

# Sandia Classified Ads Sandia Classified Ads Classified Ads Classified Ads

#### **MISCELLANEOUS**

- PIANO, Steinway, professional, vertical, walnut, just tuned, \$9,500. Smith, 299-6873.
- HUNTER CEILING FAN, white, remote control, \$165; pew-type boot bench, 40" wide, \$75 OBO. Stephens, 323-9523.
- ANTIQUE DOORS, beautiful ornate, beveled glass, all hardware, \$600; antique armoire, \$75. Ewen. 836-3563.
- TSL THORNBIRDS, great in mud & sand, 31x12.50R15, good condition, \$500 for set of four. Jewell, 892-6373
- CHEMICAL ISOLATION HOOD, recycled, used for sandblast cabinet, needs new gloves, \$20. Staufffer, 268-8819.
- KING-SIZE MATTRESS SET, \$125. Harris, 821-3001.
- TABLE, w/6 chairs, black contemporary from TEMA, \$500 or make offer. Sala, 899-6020.
- CELLULAR PHONE, '99 Mitsubishi G150 digital, w/all accessories, excellent condition, new \$150, sell \$50. Buteau, 856-7705.
- STRING TRIMMER, 31cc Ryobi, needs some work, \$10. Lunt, 898-9501.
- JEWELRY & GEMSTONE SHOW, UNM Conference Center, 1634 University NE, 11/17 10 a.m.-5 p.m., 11/18 11 a.m.-5 p.m. free admission. Hlava, 255-5478
- RECLINERS, 2, matching, beige, good condition \$150; light-oak TV stand, w/glass doors, \$40; light oak magazine table, \$20. Neugebauer, 294-1922.
- UTILITY TRAILER, ATV/motorcycle, 5 x 8, tilt bed, 13-in, tires, tie-down hardware, \$495 Alarid, 237-2888.
- BABY CRIB, by Lind, everything new, includes mattress, Disney Babies bumper, sheets, hanging mobile, \$225. Townsend, 277-6660.
- FURNITURE: couch & love seat, swivel rocker, child's dresser, trundle bed w/mattresses, computer desk w/hutch, best offer each. Fromm-Lewis, 291-8181
- ANTIQUE SEWING MACHINE, Singer, 1905, modified from peddle to knee elec., shuttles (bullet type), quilting bar, all accessories & original Singer machine book. \$175. Coe, 266-6579, ask for Nina.
- THE PHONICS GAME, barely used, paid \$300, asking \$150 OBO. Black, 836-0552.
- EXERCISE BIKE, recumbent, good condition, \$25. Meeks, 828-9825.
- GARAGE SALE, Lomas at Eubank, 1024 Wade Circle, Sat., Nov. 17, 9 a.m.-2 p.m., furniture, kitchen items, diving accessories, books. Neff, 298-3895.
- CRAFT FAIR, Holy Ghost School, San Pedro N. of Gibson, Nov. 17 & 18, complete your holiday shopping. Austin, 256-1563.
- TWO DOGS, to a good home, lovable medium-sized mutts must stay together if possible. Rhodes, 899-5444. CAMERA, RZ67 professional system,
- like new, many lenses & extras, \$6,200. Luther, 822-1187.
- PORTABLE KENMORE DISHWASHER black, excellent condition, \$275: Whirlpool gas stove, white, \$100. Mangan, 232-6791.
- ILID TIDES BE Goodri 33x12.50x15, on new 6-hole white-spoke rims, only 800 miles \$400. Rumpf, 298-7839.
- SOUTHWEST AIRLINE TICKETS 4 ea., anywhere SW flies, \$300 ea. Jacksits, 866-7383.
- PIONEER CD CAR STEREO, DEH2000, Mosfet, 45Wx4, Supertuner III-EEQ, detachable face w/case new, \$150. Burgin, 299-6730.
- CRAFTSMAN TABLE SAW, 3-hp beltdrive, cast-iron table & extensions, includes dado molding table insert, excellent condition, rolling platform, \$300. Vigil, 271-1328.

- BUNK BEDS, solid wood, w/ mattresses, guard rails, & ladder, \$500; pingpong table, \$15; boy's Schwinn bicycle, \$40. Garrison, 292-8973.
- MICROWAVE, \$60; range hood, \$25. Nicolaysen, 275-9657.
- TICKETS, roundtrip, transferable, anywhere Southwest flies, expires 9/22/02, \$235. Epperson, 271-9880.
- ENTERTAINMENT CENTER, solid oak, w/storage space, fits 28-in. TV, 63W x 45H x 20D, \$150. Anderson, 266-6342.
- **BOSE SURROUND SOUND or stereo** speakers, 4.2 speakers, like new, \$200; Bose 301 speakers, \$100. Thornhill, 298 5641.
- TREADMILL, stay warm this winter, used system, works great, all the bells & whistles, \$225. Contreras, 292-7831 ask for Rick.
- TEMA TABLE, w/4 chairs, 42-in. round, \$60; 14K white/gold wedding ring, .68ct diamond, size 5-3/4, \$1,000. Wagner, 298-7839.
- LUGGAGE, 32", large, black & dark green, on rollers, used only once, \$25. Burstein, 821-6688.
- TICKETS, anywhere Southwest flies, 2 roundtrip coupons good through Sept. 2002, \$275 ea. Krukar, 469-5944.
- WEDDING DRESS, size 12, white, beautiful, brand new, never been worn, sweetheart neckline, includes matching veil, \$600 OBO. Mirabal, 550-6433, ask for Desiree.
- DINETTE SET, 6 chairs, contemporary black & brass/glass, \$200; Baldwin spinet piano \$1,000. Flores, 291-0512
- CHRISTMAS TREE, 7-1/2-ft., w/stand, \$35; 2 sliding shower doors, 57" x 28", \$10 ea., OBO. Vittitoe, 299-9298
- BAR STOOLS, 2 for \$50; black wrought-iron patio furniture, 2 chairs, table, \$50. Marder, 291-8140.
- BUNK BED, full/twin, w/white tubular frame, \$50 OBO Lauben, 275-7466.
- WOOD-FRAME SHED, 6' x 8', only 2 mos. old, you haul from East Mountains, \$600 OBO. Feldner, 286-8157
- GODIN WOOD STOVE, freestanding, fire-brick-lined, burns wood or coal, round, w/claw feet, very unique, \$500 firm. Bronkema, 286-0423.
- TIRE RIMS, five 6-hole, 15-in., white, \$50. Arning, 256-9229.
- CELL PHONES, 2, Voicestream analog Motorola Spirit 1500 & Flore, w/leather cases, 2 automobile & 2 120V chargers, \$60. Hall, 858-1669.
- GI CANS, 10-gal., 4 ea., free; used wooden doors, 3 ea.; used screen door, 1 ea., free. Hayes, 299-1200
- CAMPER SHELL, fiberglass, white, 6' x 8', will fit most older model pickups, \$450 OBO. Shoemaker, 869-2775
- DINING TABLE, Danish rosewood, w/6 chairs, \$1,500; bookcase, \$800; chest, \$500; end table, \$100. Hubbard, 291-8463.
- ENTERTAINMENT CENTER, lots of storage, 56" x 58" x 21", oak w/smoked glass, holds 27-in. TV, \$250. Loudermilk, 299-4621.
- HOUSEFUL OF FURNITURE, loveseats, oak dining set w/6 chairs, brass beds, glass-top end, coffee, & sofa tables, show 11/16-17. Gallegos, 286-7994
- LADIES RING, 1-carat marquise, color F, clarity SI1, 1/2 TCW baguettes, retail \$7,400, asking \$5,000. Jaramillo, 350-9369.
- SMITHSONIAN magazines, complete collection, free. Smith, 244-8346. OAK DINING ROOM TABLE, like new,

w/chairs, 2 yrs. old., \$600.

Clements, 265-5920. SNAKE, baby Western hognose, includes cage setup, \$100 OBO. McCrory, 790-6688, pager.

- How to submit classified ads DEADLINE: Friday noon before week of publication unless changed by holiday. Submit by one of these methods:
- E-MAIL: Janet Carpenter (classads@sandia. gov)
- FAX: 844-0645
- MAIL: MS 0165 (Dept. 12640) • DELIVER: Bldg. 811 Lobby
- INTERNAL WEB: On Internal Web homepage, click on News Center, then on Lab News frame, and then on the very top of Lab News homepage "Submit a Classified Ad." If you have questions, call Janet at 844-7841. Because of space constraints, ads will be printed on a first-come basis.

#### Ad rules

- 1. Limit 18 words, including last name and home phone (We will edit longer ads).
- Include organization and full name with the ad submission
- 3. Submit the ad in writing. No phone-ins.
- Type or print ad legibly; use accepted abbreviations
- One ad per issue.
- We will not run the same ad more 6. than twice.
- 7. No "for rent" ads except for employees on temporary assignment
- No commercial ads.
- For active and retired Sandians and DOE employees.
- 10. Housing listed for sale is available without regard to race, creed, color, or national origin
- 11. Work Wanted ads limited to student-aged children of employees.
- 12. We reserve the right not to publish an ad.
- DINING ROOM TABLE, wood w/glass inserts, 40" x 70", 6 chairs, 2 20-in. extensions; matching china cabinet, \$1,800. Lange, 856-1952.
- WASHER/DRYER, Whirlpool, 8-cycle, heavy-duty, about 6 yrs. old but like new, \$500. Gentry, 771-0461.
- PALM M105, new in original shrinkwrapped box, \$125. Jacobs,
- 797-4939. PING-PONG TABLE, 3/4-in. top, folding, on wheels, \$50; Lifestyler Aircycle exercise bike, \$75. Reed, 268-7484.
- COUCH & 2 LOVESEATS, all match, off-white, very clean, excellent condition, \$750. Peters, 294-0363
- DECODER CARD, PC-DVD, hi-resolution, \$45; AGP graphicsdisplay TV/video-capture card, \$65; MP3 player, \$35. Hale, 298-1545.
- FREEZER, Sears, frost-free, standing, 15 cu. ft., \$125. Sansone, 296-7945
- CHERISHED CREATIONS, arts & crafts show, Wyoming Mall, open house Thanksgiving night, 6 p.m.-9 p.m., Fri. 23rd & Sat. 24th, 10 a.m.-6 p.m., Sun. 25th, noon-5 p.m. Self, 296-4137.
- TRANSFERABLE GM REBATE, gas-tank settlement, \$250-\$500 off purchase of new GM vehicle, asking \$100. Zeuch, 296-4969.
- BOATING LIFE JACKETS, 3 1 infant's, 2 small child's, \$5. Woods, 884-4224.
- WOMEN'S WEDDING BAND SETS, 3 ea., \$400-\$1,000, OBO; collectible oval woodbase w/glass top, \$50. Valencia, 298-9254.

#### **TRANSPORTATION**

- '96 DODGE 2500 RAM PICKUP, 4x4, silver & dark green, 110K miles, excellent condition, power everything. Mickey, 452-3907.
- '89 TOYOTA 4-RUNNER, AT, great condition, 117K miles, big tires, \$6,300. Adams, 281-6767.
- '82 CADILLAC FLEETWOOD, tan, leather seats, AC, cassette, 121K miles, new motor in '94, \$1,300. Cole, 550-6618.

- '83 TOYOTA PICKUP, 148K miles, 5-spd., \$1,100. Westfall, 884-8701
- '92 GMC TRUCK, 4x4, \$4,000 extra accessories, will sell for \$9,000 OBO. Garcia, 384-0013.
- '96 CHEVY BLAZER LT, red, 4-dr., leather, V6, CD, PW, PL, 71K miles, hands-free phone, good condition, \$12,800 OBO. Briggs, 259-1984.
- '97 JEEP CHEROKEE SE, 4x4, 4-dr., 52K miles, loaded, priced \$2,000 below retail at \$11,500. Bogdan, 332-3179.
- '00 MAZDA MIATA LS, silver w/tan top, tan leather, Bose CD, likenew condition, 18K miles, \$19,000. Dobbs 281-1958
- '92 FORD TAURUS, AT, AC, PB, PS, cruise, good mechanical condition & appearance. \$2,000 OBO. Anderson, 293-2490.
- '01 DODGE RAM 2500 HD, quadcab truck, 4x4, excellent condition, loaded, 14,900 miles, white, long bed, 5-spd., 5.9L, gas, alloys, asking below loan value at \$19,000. Dwyer, 271-1328.
- '96 DODGE VAN, pop-top camper, 1-ton, excellent mechanically, 360 motor, 16-mpg, 40K miles, \$8,500. Moore, 296-6586.
- '79 AMC CONCORD SW, white w/black stripe, 4-dr., 6-cyl., runs well, needs a good home, \$800. Cleland, 281-2228
- '99 TOYOTA TACOMA PICKUP, Pre-Runner SR5, AT, bed liner, extended cab, AM\FM cassette, excellent condition, \$14,950 OBO. Lininger, 856-0422.
- '84 MAZDA RX-7, excellent body condition, new paint, good mechanical condition, \$2,900. Stubblefield, 298-2991
- '91 FORD MUSTANG LX 5.0, fully loaded, new tires, 67K miles, CD player, very clean \$6,950. Martin, . 296-8154.
- '00 JEEP CHEROKEE CLASSIC, 4x4, AT, PW, PD, 18K miles, white, like new, \$16,400. Davidson, 293-9486.
- '90 BMW 325iX, AWD, 5-spd., 4-dr., loaded, excellent condition, maintenance records, \$6,500. Ritchey, 298-4311.
- '93 SATURN SL2, 4-dr., 5-spd., AC, very low mileage. 70K miles, black/brown, good condition,
- \$3,200 OBO. Potter, 292-5224. '93 BMW 325I, loaded, new tires & brakes, leather interior, sunroof, 119K miles, \$9,800 OBO. King, 286-6228.
- '82 NISSAN 280ZX, new brown paint, good condition, tires, brakes, rotors, & head replaced, \$3,500. Vigil, 856-3558.
- '90 TOYOTA ČELICA GT, 1 owner, 97K miles, excellent condition, 5-spd., recent clutch, brakes & transmission rebuild. \$3,900. Reed, 889-9790.
- '00 CHEVY SILVERADO LS 2500, 4x4, extended cab, AT, loaded, 20K miles, towing package. Salvador, 869-4228. '95 CADILLAC SEDAN DEVILLE, light
- blue, 55K miles, leather, security system, aluminum wheels, new tires, \$10,800. Benson, 299-3315
- '93 LEXUS LS400, excellent condition, \$12,525; '86 Mazda 626, white, runs well, \$1,125 OBO Stockham, 856-7768.
- '78 BUICK REGAL, 70K original miles, AT, AC, new tires, well maintained, \$1200. Blair, 292-8969. '87 TOYOTA COROLLA, 2-dr., red,
- 5-spd. transmission, 100K miles, excellent condition, \$3,000 OBO. Walters, 857-9767.
- '95 ELANTRA, PS, PB, AC, cruise, AT, 30-mpg, runs & drives well, \$2,550, OBO. Barthelmes, 286-1491
- '98 TOYOTA CAMRY LE-V6, every option except leather, excellent condition, original owner, 52K miles, \$13,500 OBO. Rahimian, 385-5638.

- '89 PLYMOUTH GRAND VOYAGER SE, 20K miles on new rebuilt engine, many new parts, \$1,995 OBO. Ross, 332-0659.
- '91 FORD ESCORT LX, 4-dr. hatchback, silver, AT, AC, PB, PS, clean, 48K miles, \$1,600. Baldwin, 856-5309.

#### RECREATIONAL

- '92 PALOMINO FILLY POP-UP CAMPER, excellent condition, hardly used, contains refrigerator, icebox, & heater, \$3,500. Chavez, 281-4789.
- '98 FLEETWOOD PROWLER, travel trailer, 26-ft. fiberglass, super slide-out, sleeps 6, equalizer hitch, brake controller, used very little, \$13,500 OBO. Hamberg, 857-9662.
- '79 GS1000E MOTORCYCLE, new tires, grips, coils, battery, mirrors, garage-kept, \$3,000 OBO. Gallegos, 296-4170.
- '87 HONDA SHADOW VT1100, shaftdrive, windshield, bag, helmet, new battery, very good condition, \$2,400 OBO. Kolb, 299-3403.

#### **REAL ESTATE**

- 4-BDR. HOME, 2-1/2 baths, 2,581 sq. ft., brick, plus 2-car garage, nice NE neighborhood, \$179,600.
- Ferrell, 256-2531. 4-BDR. HOME, High Desert, 3 baths, approx. 3,000 sq. ft., huge family room w/FP, light & bright open floor plan, lots of upgrades, \$379.900. Lucero, 856-7501.
- 2-BDR. TOWNHOUSE, 1 bath, in Rio Rancho, new carpet, stove, & tile work in bathroom, great deal & cheaper than renting. Rohl,
- 833-3697. 3-4 BDR. TOWNHOME, 3 levels, 1,900 sq. ft., 3-1/2 baths, basement, hardwood floors, new carpet & paint, access to pool, tennis courts, basketball court, & putting green. Hoffman, 922-9641
- 4-BDR., MOSSMAN TRI-LEVEL. 2,300 sq. ft., 2-3/4 baths, hardwood floors, 2-car garage. Wright, 889-3389.
- MOUNTAIN PROPERTY, 10 acres, Manzano Mtns., wooded, beautiful views, 20 mi. to Sandia, \$80,000. Stephens, 265-5341.
- 3-BDR. TOWNHOUSE, 1-3/4 baths, 2-car garage, 1,250 sq. ft., new paint & carpet, \$92,500. Mulryan, 822-0398, or see at web site www.nmcasa.com.

#### WANTED

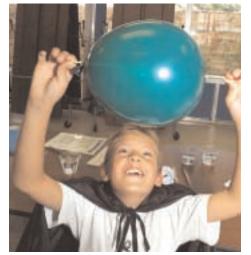
- FULL-SIZE FUTON, hardwood, good condition. Rezac, 281-1816, ask for Lorinda.
- CORVETTE, '68-'72 project car, any condition, doesn't have to be running. Briand, 821-1904.
- UTILITY TRAILER, reasonably priced, great for hauling wood, trash, etc. Zender, 294-8210.
- LEHIGH-LAFAYETTE ALUMNI, meet 11/17 at Skybox Grill (Tramway/ Indian School), 10 a.m., to watch game via satellite. DiGiovanni, 453-3446.

#### **LOST & FOUND**

- RING FOUND in women's rest room at C and X aisles in Bldg. 880, 10/16/2001, call to identify & claim. Jennings, 845-9554.
- LOST, AG RUSSELL POCKET KNIFE, w/black handle, between parade ground & Credit Union, on 10/29/01. Gerstle, 797-1946.

# Make a Difference Day draws out best in Sandians







Making a difference is something that Sandians as a culture seem committed to — both at the national level and in their own communities. Case in point: the annual Make a Difference Day on Oct. 26-27 gave Sandians an opportunity to stand tall in that conviction. Some 230 Sandians (organized by Darlene Leonard of Dept. 12650) volunteered their time at 15 locations around Albuquerque, doing all kinds of things to make the community a better place to live. (Sandia/Californians this year for the first time formally participated in Make a Difference Day. Read about their efforts on page 3.) In New Mexico, Sandia volunteers helped pack holiday boxes for the Salvation Army, helped dress up the landscaping at various sites, including The Ronald McDonald House, and helped spruce up hiking tails in the Sandia Foothills.

Some of the most memorable moments reflected on the faces of children in the Campfire Boys & Girls after-school program at Collet Park Elementary School, where Sandians performed science experiments showing students the fun of technology. And students at McCollum Elementary can "visit" all 50 states during recess, now that volunteers have painted a 35-foot map of the US on their playground.

